

QUICK CEILING FAN HOUSING AND CANOPY INSTALLATION ASSEMBLY

FIELD OF THE INVENTION

5 This invention relates to a ceiling fan anchoring bracket and housing assembly for quick and easy installation of the ceiling fan housing for either hugger and down-rod mounted fans. The bracket and housing assembly enables the user to install the ceiling fan housing to the anchoring bracket with relative ease. By employing the inventive design of the bracket and housing assembly, users are only required to align and engage one side of the housing to the hook-up pins on the bracket
10 and push the opposite side of the housing onto the lock-up pin on the bracket through spring or urging action to complete the installation.

BACKGROUND OF THE INVENTION

 Ceiling fans are very common household and commercial appliances. Conventional ceiling
15 fan housings are difficult to install due to the installer having to perform a number of difficult manoeuvres. Installing a conventional ceiling fan housing usually requires the installer standing on a stool or scaffold trying to work overhead with aligning the holes on both the anchoring bracket and the housing and inserting screws into the holes and try to tighten the screws with screw drivers all at the same time. The relatively heavy motor housing and rotor components of the hugger mounted
20 fans add to the installation difficulty. Moreover, the limited space for turning the screws below the ceiling makes the screw tightening extremely arduous. Such traditional ceiling fan housing installation method is evidently unsatisfactory. It requires the installer great dexterity, patience, efforts and time in order to securely install the motor housing to the anchoring bracket.

It is therefore highly desirable to eliminate the need to screw the ceiling fan housing to the anchoring bracket so that a user only needs to simply push and snap the housing and secure the housing to the bracket for ready use.

Attempts have been made to achieve this objective in the prior art. For example, US Pat. No. 5 6,200,099 (issued to Liao on Mar. 13, 2001) discloses a mounting mechanism without the need to use screws. It provides a frame for anchoring to the ceiling. Two pairs of base plates are used to secure the frame to the corresponding lugs on the upper circumference of the motor housing through a gap and slots and a resilient member. Even the Liao method avoids resorting to utilizing screws, it appears to be equally complicated in the assembly process, especially given the limited working 10 space below the ceiling. United States Pat. No. 6,171,061 (issued to Hsu on Jan. 9, 2001) teaches a suspending bracket for receiving a ceiling fan housing without the need of screws. The Hsu system is somewhat simpler than the Liao system. It provides two diagonally opposed spring-biased steel balls partially embedded half way inside the blind holes of an anchoring frame. There are two corresponding holes located on the inwardly extending lugs positioned along the top rim of the fan 15 housing. During installation, a user presses the housing against the anchoring frame and rotates the housing until the holes on the lugs engaged with the two steel balls, thereby locking the housing in position. However, the constant vibration of the motor housing will cause the ball-and-hole locking mechanism to degenerate and deteriorate over time and pose the hazardous danger of disengaging the fan housing from the anchor frame. Accordingly, it is beneficial to develop a mechanism which 20 eliminates the need to use screws to fasten the fan housing to the anchoring bracket and, at the same time, promotes ease of installation and ensure permanent locking security.

It is also advantageous to be able to disengage the housing from the anchor bracket with simple manoeuvres and without having the need to resort to special tools.

SUMMARY OF THE INVENTION

5 The present invention provides a ceiling fan anchoring bracket and housing assembly for quick and easy installation of the ceiling fan housing to the bracket. The bracket and housing assembly enables the user to latchingly engage the housing to the ceiling anchoring bracket by simple actions with relative ease and without the need to use any tool.

10 It is a principal object of the invention to provide an improvement in the mechanical structure of a ceiling fan anchoring bracket and housing assembly which can be readily coupled together securely. Such bracket and housing assembly can be used for both types of ceiling fans, namely hugger mounted and down-rod mounted fans. For hugger mounting, the present invention is used to install the motor housing onto the ceiling bracket. For down-rod mounting, the present invention is used to install the down-rod canopy onto the ceiling bracket.

15 Accordingly, the present invention provides for a hugger ceiling fan anchoring bracket and housing assembly which comprises a fan anchoring bracket equipped with a hook-up means and a lock-up means; the hook-up means and lock-up means are mountably attached to the fan anchoring bracket and the lock-up means is capable of exerting spring biasing action to lock a fan housing in a secure position; and the fan housing is equipped with corresponding means for engaging the hook-up
20 means and the lock-up means.

 The present invention also provides for a down-rod ceiling fan anchoring bracket and canopy assembly which comprises similar components as disclosed in the foregoing.

BRIEF DESCRIPTION OF THE DRAWINGS

Advantages and features of the invention will become more apparent with reference to the following description of the presently preferred embodiment thereof in connection with the accompanying drawings, wherein like references have been applied to like components, in which:

5 **Figure 1** shows a perspective view of a user installing a hugger mounted ceiling fan motor housing to the anchoring bracket of the present invention with a simple push-up movement;

Figure 2a shows a side view of the anchoring bracket of a hugger mounted ceiling fan with the components of the locking device and hook-up pins of the present invention;

Figure 2b shows a side view of the hugger mounted ceiling fan housing provided with lock-up pin
10 engaging hole and hook-up pin engaging hole;

Figure 3a shows a bottom perspective view of the anchoring bracket of a hugger mounted ceiling fan of the present invention with the locking device and hook-up pins mounted thereon;

Figure 3b shows a top plane view of the anchoring bracket of a hugger mounted ceiling fan of the present invention with the locking device and hook-up pins mounted thereon;

15 **Figure 3c** shows a side view of the anchoring bracket of a hugger mounted ceiling fan of the present invention with the locking device and hook-up pins mounted thereon;

Figure 3d shows a top perspective view of the anchoring bracket of a hugger mounted ceiling fan of the present invention without the locking device and hook-up pins;

Figure 4a shows an enlarged perspective view of the components of the locking device of the
20 present invention for a hugger mounted ceiling fan;

Figure 4b shows an enlarged perspective view of the hook-up pin of the present invention;

Figure 5a shows the housing of a hugger mounted ceiling fan engaging into the hook-up pins of the present invention;

Figure 5b shows the housing of a hugger mounted ceiling fan latching into the lock-up pin of the present invention; and

5 **Figure 6** shows the hugger mounted ceiling fan housing securely engaged into the anchoring bracket of the present invention;

Figure 7 shows a perspective view of a down-rod ceiling canopy being installed onto the anchoring bracket of the present invention with a simple push-up movement;

10 **Figure 8a** shows a front and top perspective view of the anchoring bracket of a down-rod ceiling fan with the components of the locking device and hook-up pins of the present invention;

Figure 8b shows a perspective view of the down-rod ceiling canopy provided with one lock-up pin engaging hole and two hook-up pin engaging hole;

Figure 9a shows a front and top perspective view of the anchoring bracket of a down-rod ceiling fan of the present invention;

15 **Figure 9b** shows a left side view of the anchoring bracket of a down-rod ceiling fan of the present invention;

Figure 9c shows a right side view of the anchoring bracket of a down-rod ceiling fan of the present invention;

20 **Figure 9d** shows a front view of the anchoring bracket of a down-rod ceiling fan of the present invention;

Figure 9e shows a top view of the anchoring bracket of a down-rod ceiling fan of the present invention;

Figure 10 shows an enlarged perspective view of the components of the locking device of the present invention for a down-rod mounted ceiling fan;

Figure 11a shows a perspective view of the down-rod ceiling fan canopy of the present invention;

Figure 11b shows a front view of the down-rod ceiling fan canopy of the present invention;

5 **Figure 12** shows the L-shaped resilient C-wire mounted onto the side of the anchoring bracket of a down-rod ceiling fan and cooperatively urging the lock-up pin against the bracket flange;

Figure 13a shows the first step in installing the canopy of the down-rod fan by aligning and hooking the canopy to the hook-up pins mounted on the anchoring bracket;

10 **Figure 13b** shows the second step in installing the canopy of the down-rod fan by pushing and locking the canopy to the lock-up pin mounted on the anchoring bracket; and

Figure 13c shows the canopy of the down-rod fan securely engaged into the anchoring bracket of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 The anchoring bracket and housing assembly of the present invention is comprised of three parts, namely a ceiling anchoring bracket, a housing locking device mounted on the anchoring bracket and a ceiling fan motor housing for hugger mounted fans or, in the case of down-rod mounted fans, a canopy for latching to the anchoring bracket with the aid of the locking device.

20 According to the present invention, a user can complete the housing installation of a hugger mounted fan by simply align and engage one side of the housing to the hook-up pins on the bracket and push the opposite side of the housing to securely latch onto the lock-up pin on the bracket

through a spring action (see Figure 1). In the case of a down-rod mounted fan, the user can install the canopy to the ceiling anchoring bracket with similar latching manoeuvres (see Figure 7). While the inventive concept for installing the motor housing (in the case of hugger mounted fans) and the canopy (in the case of down-rod mounted fans) is the same, for clarity of presentations, the two types of installations will be discussed separately below.

Hugger Mounted Fans

Referring to Figure 2a, an anchoring bracket **20** of the present invention is disclosed. The general shape of anchoring bracket **20** resembles a low-rise inverted “U” with the “wings” spreading out on both sides. The bracket has a ceiling anchoring plate **25** in the middle which is secured to the ceiling with conventional screws. There are a plurality of fan motor screws **27** provided on each side of ceiling anchoring plate **25**. Anchoring plate **25** has an arc welded J-hook **29** for convenient circuit connection. The foregoing components are well taught in the prior art.

A slightly convexed flange is provided at each end of the “wings” of anchoring bracket **20**. Each of the two ends of the “wings” is designated as the hook-up end and locking end, respectively. On the hook-up end, there is the hook-up pins housing engaging flange **23**. Directly opposite to the hook-up end is the locking end and it provides the locking device housing engaging flange **22**. According to one embodiment of the invention, two hook-up pin receiving holes **26** are located on flange **23** to receive hook-up pins **28** (see Figures 2a and 3a). Optionally, hook-up pins **28** (see Figure 4b) may be screwed into holes **26** (see Figures 3a to 3c). The position of hook-up pins **28** corresponds to the hook-up pin engaging holes **36** on the motor housing **30** (see Figure 2b).

On the locking device housing engaging flange **22**, a lock-up pin receiving hole **24** is

provided at around the middle of flange **22** (see Figure 3d). Hole **24** receives the head portion X of lock-up pin **12**, which latchingly engages to the lock-up engaging hole **34** on motor housing **30** (see Figure 2b).

The locking device **10** is now described with reference to Figure 2a and Figure 4a. The locking device **10** is comprised of a lock-up pin **12** with a head portion X, a body portion Y and a relatively short tail portion Z. The head portion X takes the shape of a round-headed cone. The base of the cone connects to body portion Y after passing a connector portion with larger diameter. The connector portion keeps the body portion Y inside the locking device housing engaging flange **22**. The body portion Y is inserted into coil spring **18** which has an approximate length as portion Y. Since the dimension of the base of the head portion X is larger than the diameter of coil spring **18**, the head portion X is exposed from spring **18** and protrudes outside the locking device housing engaging flange **22** through lock-up pin receiving hole **24**.. However, the tail portion Z of lock-up pin **12** extends beyond spring **18** and abuts against the lock-up pin recess **17** located on the vertical wedge of the L-shaped locking plate **14**. The L-shaped locking plate **14** is, in turn, mounted on the upper side of anchoring bracket **20** by locking plate screws **16** through locking plate screw holes **19** and unto bracket **20**, through locking plate receiving holes **21** from below. Figures 3a, 3b and 3c illustrate the position of the locking device **10** relative to the other components on the anchoring bracket **20**.

Figures 5a and 5b illustrate the relatively easy installation of the ceiling fan motor housing **30** onto the anchoring bracket **20** by latchingly engaging the locking device **10** of the present invention. The user first aligns the two hook-up pin engaging holes **36** with the two hook-up pins **28** on ceiling anchoring plate **25** and moves the housing towards the plate (as in the

direction indicated by arrow A in Figure 5a) until the pins **28** are engaged to the holes **36**. Once the hook up is completed, the user then proceeds to lock up the housing by pushing housing **30** upward (as in the direction indicated by arrow B in Figure 5b). With the upward pushing motion, the lock-up pin **12** latchingly engages hole **34** on the motor housing when the latter comes into
5 contact with head portion X of lock-up pin **12** on the anchoring bracket **20** and forces the head portion X of lock-up pin **12** to retract (as housing **30** is pushed up) and then to urge outward and to lock into lock-up pin engaging hole **34** via the coil spring biasing action.

Figure 6 shows the ceiling fan motor housing **30** securely installed onto the anchoring bracket **20**, with the hook-up pins **28** and head portion X of lock-up pin **12** protruding outward
10 from the hook-up pin engaging holes **36** and lock-up pin engaging hole **34**, respectively.

Down-Rod Mounted Fans

Inventive features of the present invention directed to the down-rod mounted type of fans are now described with reference to Figures 7 to 13c.

15 In Figures 8a and 8b, an anchoring bracket **200** suitable for use with down-rod mounted fan canopy **300** according to the present invention is disclosed. The anchoring bracket **200** takes the shape of an “U” with two ceiling anchoring plates **205** spreading out like a pair of “wings” on each side. At the bottom of the “U-shaped” bracket there is an opening for convenient placement of the down-rod (not shown). The ceiling anchoring plates **205** are used to secure the bracket to
20 the ceiling using conventional screws. One of the anchoring plates **205** has an arc welded J-hook **209** for convenient circuit connection. As in the case of the hugger mounted fans, these components are known in the prior art.

A convexed flange is provided at the end of each of the “wings” of anchoring bracket **200**. Each of the two ends of the “wings” is designated as the hook-up end and locking end, respectively. On the hook-up end, there is the hook-up pins canopy engaging flange **203**. Directly opposite to the hook-up end is the locking end and it provides the locking device canopy engaging flange **202**.
5 According to a preferred embodiment , two hook-up pin receiving holes **206** are located on flange **203** to receive hook-up pins **208** (see Figure 8a). Optionally, hook-up pins **208** may be screwed into holes **206** (see Figure 8a). The position of hook-up pins **208** corresponds to the hook-up pin engaging holes **306** on the down-rod canopy **300** (see Figure 8b). Figures 9a, 9b, 9c, 9d and 9e illustrate the perspective, left, right, front and top views of the anchoring bracket **200**.

10 On the locking device canopy engaging flange **202**, a lock-up pin receiving hole **204** is provided at around the middle of flange **202** (see Figure 9c). Hole **204** receives the head portion X of lock-up pin **102**, which latchingly engages to the lock-up engaging hole **304** on the down-rod canopy **300** (see Figure 8b).

The locking device **100** is now described with reference to Figures 8a, 10 and 12. The
15 locking device **100** is comprised of a lock-up pin **102** with a head portion X, a body portion Y and a relatively short tail portion Z. The head portion X takes the shape of a round-headed cone. The base of the cone connects to body portion Y after passing a connector portion with larger diameter. The connector portion keeps the body portion Y inside the locking device canopy engaging flange **202**. Since the dimension of the base of the head portion X is larger than the diameter of the lock-up pin
20 receiving hole **204**, the head portion X is protruded outside the locking device canopy engaging flange **202** through lock-up pin receiving hole **204**. The body portion Y is kept in place by the L-shaped locking plate **104**. The tail portion Z of lock-up pin **102** emerges and extends beyond the

lock-up pin recess **107** located on the vertical wedge of the L-shaped locking plate **104**. The short tail portion **Z** has a shallow longitudinal slot in the middle to cooperatively and biasingly receive the urging end **112** of the L-shaped C-wire **108** (see Figure 12). The L-shaped locking plate **104** is mounted on the under side of anchoring bracket **200** by locking plate screw **106** through locking plate screw hole **109**. Figure 10 also depicts two views of the L-shaped resilient C-wire **108** having a loop end **110** for screw **106** to fasten the C-wire to anchoring hole **201** (see also Figures 9c and 12) on anchoring bracket **200**. As can be seen from Figure 12, the L-shaped resilient C-wire **108** exerts biasing force to urge locking pin **102** against the canopy flange **202**.

Figures 13a, 13b and 13c illustrate the relatively easy installation of the down-rod canopy **300** onto the anchoring bracket **200** using the locking device **100** of the present invention. The user first aligns the two hook-up pin engaging holes **306** with the two hook-up pins **208** on ceiling anchoring plate **205** and moves the canopy towards the plate (as in the direction indicated by arrow **A** in Figure 13a) until the pins **208** are engaged to the holes **306**. Once the hook up is completed, the user then proceeds to lock up the canopy by pushing canopy **300** upward (as in the direction indicated by arrow **B** in Figure 13b). With the upward pushing motion, the lock-up pin **102** latchingly engages hole **304** on the canopy when the latter comes into contact with head portion **X** of lock-up pin **102** on the anchoring bracket **200** and forces the head portion **X** of lock-up pin **102** to retract (as canopy **300** is pushed up) and then to urge outward and to lock into lock-up pin engaging hole **304** via the C-wire biasing action.

Figure 13c shows the down-rod canopy **300** securely installed onto the anchoring bracket **200**, with the hook-up pins **208** and head portion **X** of lock-up pin **102** protruding outward from the hook-up pin engaging holes **306** and lock-up pin engaging hole **304**, respectively.

It is readily understood that the number of lock-up pin and hook-up pin in either the hugger mounted fans or down-rod mounted fans is not limited to those disclosed herein.. Likewise, any suitable biasing means able to urge the lock-up pin against the lock-up pin engaging hole on the housing or canopy is within contemplation of the present invention. The coil spring **18** and L-shaped
5 resilient C-wire **108** are merely examples of preferred embodiments disclosed in this invention herein.

Hence, although the present invention has been described with referenced to two preferred embodiments, it will be appreciated by those skilled in the art that various modifications, alternations, variations, and substitutions of parts and components may be made
10 without departing from the spirit and scope of the invention. Therefore, the present application is intended to cover such modifications, alternations, variations, and substitutions of parts and components.